

WHAT IS CLAIMED IS:

1. A learning type image classification apparatus which is capable of classifying a plurality of images on a predetermined reference, comprising:

5           region clipping mode selection section which is capable of selecting a mode of clipping from the image regions out of a plurality of candidates; and

10           region clipping execution section for clipping regions from the images in a mode selected by region clipping mode selection section.

2. The learning type image classification apparatus according to claim 1, wherein the apparatus is operated at least at a learning step and at a classification step after learning, and the region clipping mode selection section and the region clipping execution section are operated at the learning step.

15           3. The learning type image classification apparatus according to claim 1, wherein the candidates of image clipping mode include a mode of automatically dividing the image into a plurality of regions by using a change in color and luminance value and clipping from the image a region obtained by integrating regions selected from a plurality of these divided regions.

20           25           4. The learning type image classification apparatus according to claim 1, wherein the candidates of the mode of clipping the image include a mode of clipping a region by using the learned category.

5. The learning type image classification apparatus according to claim 4, wherein the mode of clipping the region judges the reliability of the region clipping by using the learned category.

5       6. The learning type image classification apparatus according to claim 4, wherein the mode of clipping the region counts the number of clipped regions by using the learned category, and the image having a region number of 1 is extracted as an image  
10      learning.

15      7. The learning type image classification apparatus according to claim 1, wherein the region clipping mode displays the result of the region clipping and the operator can make a selection as to whether the result of the region clipped is to be adopted.

20      8. A learning type image classification method which is capable of classifying a plurality of images on a predetermined reference, comprising the steps of:  
          selecting a mode of clipping a region from the image from a plurality of candidates; and  
          clipping a region from the image in the selected mode.

25      9. A recording medium in which a processing program is recorded for classifying a plurality of images on a predetermined reference with a computer, the processing program comprising:

a first program providing a computer with a mode of clipping a region from the image selected from a plurality of candidates; and

5        a second program allowing the computer to clip a region from the image in the clipping mode,

wherein the first program and the second program constitute a learning type image classification program.

10      10. A learning type image classification apparatus provide with a learning step and a classification step after learning for classifying a plurality of images or automatically adding key words for retrieval to images, the apparatus comprising:

15      a learning step execution section for executing the learning step;

a classification step execution section after learning for executing the classification step after learning; and

20      a region clipping mode selection section provided with a plurality of region clipping modes, the section being capable of selecting several modes out of the plurality of the modes.

25      11. The learning type image classification apparatus according to claim 10, wherein the region clipping mode comprises a semi-automatic region clipping mode, a learning usage region clipping mode, and a interactive type region clipping mode.

12. The learning type image classification apparatus according to claim 11, wherein the semi-automatic region clipping mode comprises a region dividing section for automatically dividing the image into several regions by using the change in the color and luminance in the image;

5                   a region designation section which is capable of designating a classification object region out of the regions divided at the region dividing section; and

10                  a region integration section for integrating the region designated with the region designation section to set the region as the clipped region.

13. The learning type image classification apparatus according to claim 11, wherein the learning usage region clipping mode comprises:

15                  a section for defining a region relationship between a category which has been learned and a category which is being learned; and

20                  a region clipping execution section by the category which has been learned for executing the region clipping by the category which has been learned.

14. The learning type image classification apparatus according to claim 11, wherein the interactive type region clipping mode comprises:

25                  a section for defining a region relationship between a category which has been learned and a category which is being learned;

a region clipping execution section by  
the category which has been learned for executing  
region clipping by the category which has been learned;  
a region clipping result display section; and  
5 a judging section for judging the adoption of the  
region clipping.

15. The image classification apparatus according  
to claim 11, wherein, the learning usage region  
clipping mode further comprises a reliability judging  
10 section for judging the reliability of a region  
clipping wherein the system judges the reliability of  
the region clipping by the category which has been  
learned.

16. The image classification apparatus according  
15 to claim 11, wherein the learning usage clipping mode  
further comprises:

a region number counting section for counting the  
number of regions of the result of the region clipping  
by the category which has been learned; and  
20 a learning image candidate selection section in  
which an image in which the number of regions is  
counted 1 is set as a candidate of the learning image.

17. A learning type image classification apparatus  
which is capable of classifying a plurality of images,  
25 the apparatus comprising:

region clipping mode selection section which is  
capable of selecting a mode of clipping a region from

images from a plurality of candidates; and  
a region clipping execution section for clipping  
a region from images in a mode selected with the region  
clipping selection section.